AMAZON WEB SERVICES

Chavana Rohith[1], Desai Nihitha[2], Suruchi Talwani[3]

School of Computer Science and Engineering, Lovely Professional University Phagwara, Punjab, India[1,2,3]

Abstract: Cloud computing is growing widely and first-rate promising technology. Cloud computing is defined as storing the data and accessing data over internet, it does not store any data physical devices (Hard Disks). In this service we can store the data through internet and access it from anywhere. It has aroused the priority of the computer society of complete world. There are three types of cloud computing: 1. Infrastructure as a Service, 2. Software as a service and 3. Platform as a service. There are so many Cloud Services Providers in those some cloud providers are used widely thy are AWS (Amazon Web Services), GCP (Google Cloud Platform), Microsoft Cloud, IBM Cloud, Oracle Cloud, VMware and many more. In this paper we learn about AWS and some mostly used compute services in this AWS. AWS is a Cloud Provider; they provide servers and services that you can use on demand and scale easily. AWS has revolutionized IT over time.

1. INTRODUCTION:

AWS is the world's most globally and widely adopted cloud platform, AWS cloud was introduced in the year 2006, now it offers approximately 100 cloud services. It is developed for secure services offers database storage, compute services, networking, messaging, content delivery and other services to help in developing business growth. AWS is a scalable, cost effective, easy to implement and flexible computing solutions.

2. AWS REGIONS:

1.   AWS has regions all around the world.
2.   A region is a cluster of data centers.
1.   Each region has many availability zones, usually region has 3 zones, minimum is 2 and maximum zones is 6.
For example:
1.   ap-southeast-2a
2.   ap-southeast-2b
3.   ap-southeast-2c
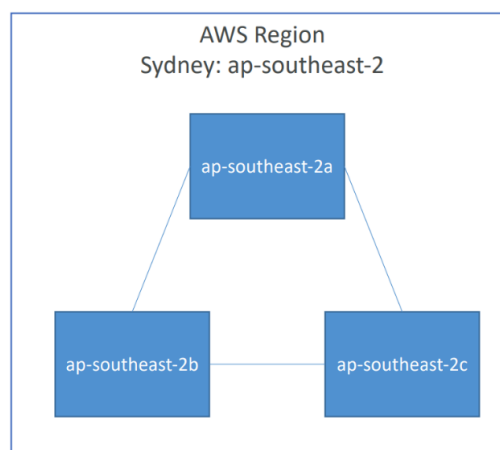
2.   Each availability zone is one or many separate or distinct data centers with two or more physical supply, connectivity, and networking.
3.   They are separate from each other, to get isolated from disasters and They are connected with high bandwidth, ultra-low latency networking.

4. AWS COMPUTE SERVICES:

4.1 EC2:

1. EC2 is one of the most used and popular of AWS offering.

2. It is a virtual machine in cloud, in which it has OS level control. Can run this whenever and wherever.

3. EC2 mainly consists of: Renting Virtual Machine.; Distributes the load across machines.; Scaling services using auto scaling.; Storing data on virtual devices.

4.2 Elastic Beanstalk:

1. Elastic Beanstalk is centric view of a developer deploying application on AWS.

2. It offers automated deployment of resources.

3. It uses all the component's like EC2, RDS, ELB, ASG, etc.…

4. The application code is responsible for the developer.

5. Elastic Beanstalk has three components:

1.   Application
2.   Application Version
3.   Environment name

Elastic Beanstalk Deployment Modes:
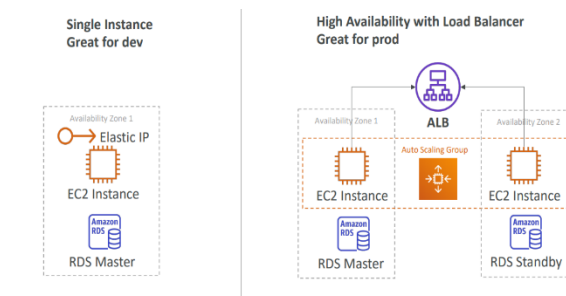
6. Elastic cloning is used to clone an environment with same configuration. It's useful for deploying test version of application.

7. Should change the settings after cloning an environment.

4.3 AWS Lambda:

1.   AWS Lambda functions virtually and no servers are required to manage.
2.   Limited by time with short executions and scaling is automated.
3.   This tool is a big cost saver and should pay only when functions get executed.
4.   Integrated with many programming languages, some of them are JavaScript; Python; Java; .Net; Ruby.
5.   AWS Lambda creates Serverless Thumbnail.
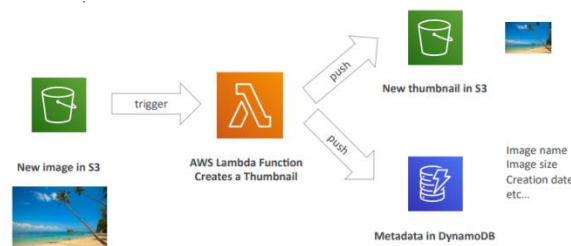
4.4. ECS (Elastic Container Service for Kubernetes)

1.   This allows to Kubernetes on amazon cloud environment without any installation.
2.   ECS Clusters are logical grouping of EC2 instances, where EC2 instance run the ECS agent.
3.   The EC2 agents registers the instance to the ECS cluster.
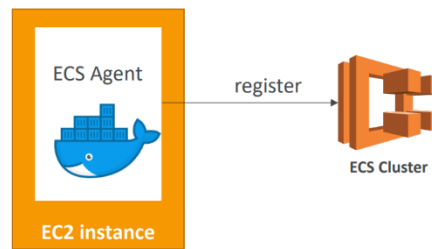
5. EFS – ELASTIC FILE SYSTEM

1. EFS manages NFS (Network File System) that can be mounted on many EC2.
2. EFS works with EC2 instances in multi – AZ (Availability Zone)
3. It is highly available, highly scalable, and also highly expensive and it is used in pay per use.
4. Used cases are: 1. content management; 2. web serving, 3. data sharing and 4. WordPress.
5. Compatible with Linux based AMI and uses security group to control access to EFS.
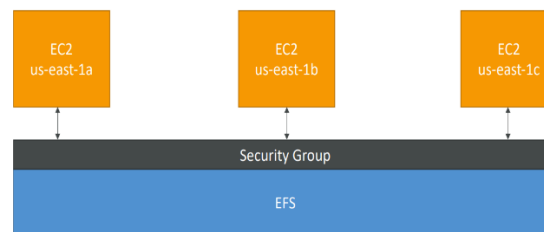
6. STORAGE:

6.1. Amazon Elastic Block Storage (EBS).

1. It provides block level storage to be used with EC2 instance. These volumes are remain independent and network attached.

2. EC2 machine loses its main drive when it is manually ended. Unexpected ending might happen on time to time.

3. An EBS volume is a network drive that can attach to instances while they run. It also allows instances to persist data.

4. This drive uses the network to communicate with the instance, which means that there might be a bit of latency. It will detached from EC2 instance and it attached to another very quickly.

6.2. Amazon Glacier:

1. It object storage meant for archiving / backup and it's available in low cost.
2. Each item in Glacier is called "Archive". Archives are stored in **"Vaults."**
3. Data is retained for the longer term.
4. Amazon Glacier has 3 retrieval options: 1. Expedited is between 1 to 5 min; 2. Standard is in between 3 to 5 hrs.; and 3. Bulk is in between 5 to 12 hrs. Minimum storage duration is 90 days.
5. It also offers fast and secure storage for data archiving and backup.
6. Transition actions: the objects which are transitioned to another storage class is called transition action.
7. After 60 days move the objects to a Standard IA class.
8. Move to Glacier to archiving after 6 months.
9. Expiration actions: This configure objects to be expire or delete after some duration.
10. Access the log files which can be set to be deleted after one year which is 365 days.
11. Can be used to delete old versions of files.
12. It can be used to delete the incomplete multi part upload.

7.   SECURITY SERVICES:

### 7.1.   IAM (Identity and Access Management)

1.   Whole AWS security is there by AWS in: 1. USERS; 2. Groups; 3. Roles.
2.   Root account should not be used, and users must create with proper permissions. IAM is at the center of AWS. Policies are written in JSON (JavaScript Object Notation).
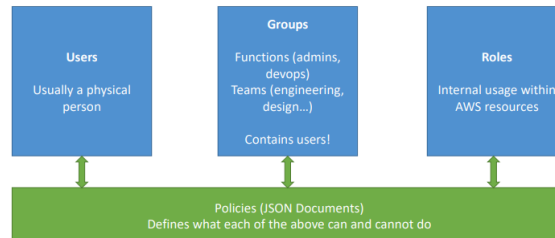
3.   IAM has global view. Permissions are governed by policies (JSON).
4.   IAM has predefined "managed policies". Big enterprises usually integrate their own repository of users with IAM.
5.   IAM credentials should never be shared and should never write IAM credentials in code.
6.   IAM policies help to control who can manage AWS RDS through the RDS API.
7.   In database user creation and permissions are managed through IAM.

7.2.   AWS Certificate Manager (ACM)

1.   This offers free SSL certificates for domains that can be managed by Rout53.
2.   SSL certificates is overall a pain to manually manage, to ACM is great to leverage in AWS infrastructure.
3.   Code runs on EC2 which is not serverless. And the run time is maximum one year.
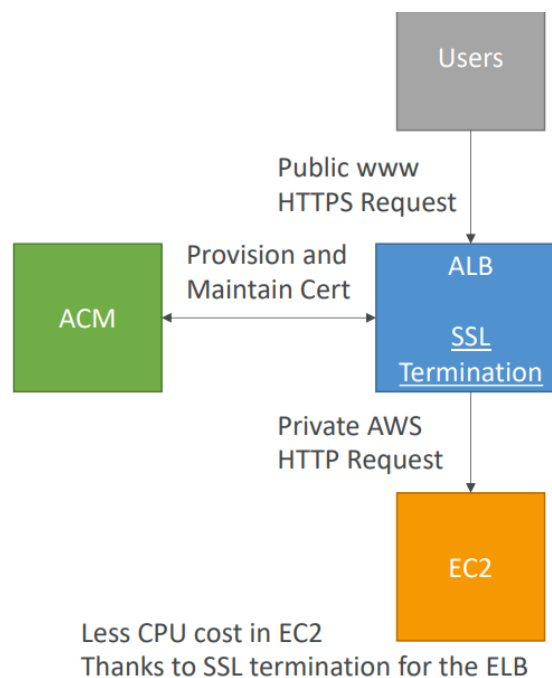
7.3.   KMS (Key Management System)

This is a managed service, and this service is helps to create & control the encryption keys which allows to encrypt data.

The keys and Policies are:

- Create
- Rotation policies
- Disable

- Enable

Can share case sensitive information anytime by using KMS. The value in the KMS is to CMK is used to encrypt the data that can never ever be computing by the user. And the CMK is to be rotated for extra security.

8. AWS DATABASE:

1. RDS: This service is easy to scale, easy to setup and easy to operate a relational database in the cloud.
2. DynamoDB – it is the fastest DB service, highly managed NoSQL database.
3. ElastiCache: This is a in-memory DB. This service makes easy to scale, easy to deploy and easy to operate in memory cache.
4. Redshift: It is an Amazon's where-housing solution which can be used to perform complex OLAP issues.
5. Neptune: This is a graph database which is very fast and scalable.
6. And DMS (Database Migration Service) & Document DB which is managed by MongoDB for AWS.

9. MANAGEMENT SERVICES

9.1. CloudFormation:

It is a declarative way of outlining an AWS Infrastructure for any resources.

In this CloudFormation template we can say anything like:

1. want security group.
2. want two EC2 machines using the security group.
3. want two Elastic IPs for EC2 machines.
4. want an S3 bucket.

Then CloudFormation creates those, in right order with the exact configuration.

9.2. CloudTrail:

It audits API calls made by users / services / AWS console.

It is useful to detect unauthorized calls or root cause of changes. It provides the governance, compliance, and audit for your AWS account. CloudTrail is enabled by default.

It gets an history of events calls made within the AWS Account by: 1. Console; 2. SDK; 3. CLI; 4. AWS Services.

I also can put logs from CloudTrail into CloudWatch Logs.

9.3. AWS Auto Scaling:

This service allows to authorize, which services user will be used, and which won't.

CONCLUSION:

AWS is easy to use, it allows application providers and vendors to quick and secure of host applications. It is flexible, we can select OS, programming language, database type of services as we need. With AWS we can receive virtual environment which can be used to load software and service of application. This is cost effective, need to pay only of storage and other resources that we used.AWS is Scalable, high performance and high secure.

REFERENCES:

www.guru99.com
www.udemy.com
AWS Demo Class in TELUGU - YouTube
AWS Tutorial For Beginners | AWS Full Course - Learn AWS In 10 Hours | AWS Training | Edureka - YouTube
Database Services in AWS | Amazon RDS Tutorial | AWS Training | Edureka | AWS Live - 2 - YouTube